

THE INSTITUTE OF PHYSICS

47 BELGRAVE SQUARE, LONDON, S.W.1

BULLETIN

No. 34

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OCTOBER 1952

INSTITUTE CONVENTION: BOURNEMOUTH 1953

Preliminary arrangements for the 1953 Convention of the Institute, to be held at Bournemouth, are now complete. This Convention, which will be broadly similar to the one held at Buxton in 1949, is intended to be for members of the Institute, their ladies and guests. Although a comprehensive scientific programme is being planned, one of the main aims of the Convention is to enable members to meet together socially and thereby to make new contacts with each other. The Convention will run from Wednesday, 27th May, until Saturday, 30th May, with the possibility of further meetings of Groups on Sunday, 31st May. The activities arranged by the Groups will be designed to be of wide interest and, of course, all members of the Institute, whether members of any Group or not, will be welcome. The outline programme is announced now in order to give members ample opportunity of making necessary arrangements to enable them to attend.

The municipal authorities of Bournemouth have been very co-operative and have placed at the disposal of the Institute all the necessary facilities for lectures and for social functions. Most of the meetings will be held in the Town Hall, the main room of which will seat about 500 people. There are ample facilities for the holding of parallel sessions of Groups with attendances of 100 or so at each.

A programme of social and technical visits is also being arranged with special outings planned for members' ladies. At the same time it is realized that those attending the Convention will wish to have adequate free time to enjoy the facilities which Bournemouth offers. A detailed programme will be circulated to members about the end of this year when provisional bookings will be invited; hotel accommodation will be bookable through the Institute at a wide range of prices. It is hoped that the attendance will be over 500.

Dr. C. E. Raven, a former Vice-Chancellor of the University of Cambridge and sometime Regius Professor of Divinity, has agreed to give an evening lecture on an ethical or philosophical aspect of science. Dr. Raven, who is well known for his interest in scientific matters, was invited to give such an address at Buxton, but his duties as Vice-Chancellor then prevented his doing so.

Dr. A. C. Menzies, Controller of Research of Hilger-Watts Ltd., has already accepted the invitation to give the first of the two main scientific lectures.

Mr. J. B. Hodgson (Associate) is acting as Local Honorary Secretary of the Convention.

The provisional programme is as follows:—

WEDNESDAY, 27 MAY

(Group meetings may be held during the afternoon)

6.00 p.m. Convention Members assemble.

8.30 p.m. Civic Reception and dance in the ball room at the Pavilion. (Evening dress.)

THURSDAY, 28 MAY

10.00 a.m. Lecture on "Recent Developments in Applied Optics" (with demonstrations), by Dr. A. C. Menzies, F.Inst.P. (Hilger-Watts Ltd.). (In the Grand Hall of the Town Hall.)

11.00 a.m. Coffee.

11.45 a.m. Discussion and questions on the lecture.

12.30 p.m. Adjourn for lunch.

Afternoon. Choice of technical visits.
Choice of social visits.

8.30 p.m. Full Conference session (visitors welcome if accommodation permits) in the Grand Hall of the Town Hall for an address on a philosophical or ethical aspect of science by Dr. C. E. Raven.

FRIDAY, 29 MAY

(Special visits for ladies during the morning)

10.00 a.m. Lecture on "Recent Advances in Nuclear Physics." (In the Grand Hall of the Town Hall.)

11.00 a.m. Coffee.

11.45 a.m. Discussion and questions on the lecture.

12.30 p.m. Adjourn for lunch.

Afternoon. Three or four Group meetings in parallel in the Town Hall.
Choice of technical visits.
Choice of social visits.

8.30 p.m. Session for members of the Institute only, in the Grand Hall of the Town Hall, for the Annual General Meeting, followed by discussion on professional and domestic matters.

SATURDAY, 30 MAY

(Special visits for ladies during the morning)

10.00 a.m. Three or four Group meetings and joint Group meetings in parallel in the Town Hall.

11.00 a.m. Coffee.

11.45 a.m. Group meetings continued.

12.30 p.m. Adjourn for lunch.

Afternoon. Choice of social visits.

7.00 p.m. Dinner parties or cocktail parties in hotels.

8.30 p.m. Conference dance (with buffet) in the Popular Restaurant at the Pavilion. (Evening dress.)

PROCEEDINGS OF THE BOARD

The Board met on 17 July, the President (Professor W. E. Curtis) in the Chair. The President-elect (Dr. C. Sykes) attended by invitation. Some of the matters discussed have already been referred to in the *Bulletin*; the following items were also dealt with in addition to formal and confidential business:—

Development Policy. A general discussion took place on the future policy of the Institute, based upon a memorandum which the Secretary had prepared at the Board's request. The memorandum incorporated a number of suggestions put forward by members in recent years. Among the items raised were:—

(i) The position of the Participating Societies. It was pointed out that the position of the Participating Societies and their representation on the Board were now anomalous. The representatives of the four Societies each expressed the view that their Councils would agree that some measure of reform was desirable to suit the changed circumstances, but it was generally agreed that changes should not be made unless it was quite clear that they would benefit the work of the Institute and the Societies. It was pointed out that the Physical Society, being the only one of the four the majority of whose members were physicists, was in a special position and it was agreed that nothing should be done which would in any way discourage closer collaboration between the Society and Institute. Reciprocal representation on the Society's Council and Institute's Board was suggested. The Officers were asked to re-examine the position of the Participating Societies within the Institute and submit proposals to the Board in due course.

(ii) Reading and discussion of original papers. At one time the Board had not approved of the reading of original papers before Branch and Group meetings, believing that survey papers should be presented. This was now no longer so. It was, however, agreed that no special steps need be taken to encourage the regular reading of original papers.

(iii) Professional activities. It had been suggested that the Institute should be more virile in "elevating the profession of physics," but it appeared to be the general view of the Board that the amount of work carried out in furthering this object of the Institute was at present sufficient.

Education.

(a) Science Teachers. The President reported on the meeting of the Parliamentary and Scientific Committee held on 19 June last at which the Chair was taken by Sir Wavell Wakefield, M.P. The meeting had discussed the serious shortage of science teachers in schools. The opening speakers had been the Headmaster of the City of London School, the

President of The Institute of Physics, and the Deputy Secretary of the Ministry of Education. A short discussion had followed in which, among others, the following took part: The Earl of Halsbury, Mr. Austen Albu, M.P., Mr. A. L. Bacharach, Major Hume, Dr. Lang, Dr. Whitehead, Mr. S. Mayne and the Chairman.

The Committee had agreed to pursue the subject at its next meeting, which would be instructing its deputation to the Chancellor of the Exchequer and the Lord President of the Council on the points to be followed up arising from the recent debate in the House of Lords.

(b) Representation on advisory and other committees.

(i) *Norwood Technical College.*

Mr. M. W. Thring (Fellow) was re-appointed as the Institute's representative on the Governing Body of Norwood Technical College.

(ii) *London Regional Advisory Committee for Applied Physics.*

Mr. F. Y. Poynton, Mr. G. W. Warren and Mr. N. Clarke were re-appointed as the Institute's representatives on this Committee.

(iii) *Yorkshire Council for Further Education.*

In response to a request from the Yorkshire Council for Further Education that the Institute appoint four representatives to an Advisory Panel for Physics, the following have been asked to serve and have agreed to do so: Dr. K. W. Andrews (Associate), Dr. M. O. Pelton (Fellow), Mr. E. W. Taylor (Fellow) and Mr. S. L. Anderson (Fellow).

Library Policy. Mr. E. W. H. Selwyn presented a report of the Institute's representatives on the Joint Library Committee with the Physical Society. The report, which makes recommendations concerning changes in the control of the Library, was approved for submission to the Council of the Physical Society for its comments.

Thanks to Retiring Members. The best thanks of the Board were accorded to Mr. E. R. Davies for his great service as Honorary Treasurer for six and a half years. Dr. T. E. Allibone, Professor A. M. Tyndall, Mr. J. H. Awbery and Mr. E. W. H. Selwyn, who would be retiring at the end of the session, were thanked for their work as members of the Board. On the proposal of Dr. F. C. Toy it was unanimously resolved that the best thanks of the Board be accorded to Professor W. E. Curtis for the magnificent work he had done for the Institute and particularly for the admirable way in which he had presided over the meetings of the Board. Professor Curtis briefly replied.

NOTICES TO MEMBERS

International Tables for X-ray Crystallography

Volume I (Symmetry Groups) of the International Tables for X-ray Crystallography, published for the International Union of Crystallography, is now ready. The text and tables (in English) have been planned to be of the maximum practical usefulness in the determination of crystal structures and in allied problems, but their value for teaching purposes has also been kept in mind. The price is five guineas inclusive of postage and packing; cloth binding, 558 + x pages,

237 figures, with dictionary in English, French, German, Russian and Spanish. Members of The Institute of Physics may obtain one copy for their personal use only at the subscription price of £3 post free by using a special order form available, with the prospectus, from the Kynoch Press, Wotton, Birmingham, England.

Volumes II and III, which are in preparation and which will be sold separately, will cover Mathematical, Physical and Chemical Tables used in X-ray Crystallography.

Institute Meetings

A list of Institute meetings to be held in the half session up to the end of January 1953 has already been circulated to all members. Since the list went to press details of the following three meetings have been completed.

On Thursday, 16 October, the London Branch is co-operating with the Royal Institute of Chemistry (London and South-Eastern Counties Section) and the Institute of Biology in a discussion on "The Place of the Scientist in Civil Defence." It will be held at the City of London School, Victoria Embankment, E.C.4, at 6.30 p.m. The principal speakers will be Sir John Hodsall, Sir Charles Ellis, Dr. E. T. Paris, Professor W. V. Mayneord and Professor H. N. Rydon.

On Friday, 17 October, the North-Eastern Branch will hold a meeting in the Durham Colleges, University of Durham, at 6.15 p.m. (tea at 5.30 p.m.) when Dr. G. W. Brindley, F.Inst.P. (University of Leeds), will speak on "X-ray and other physical methods of studying clay minerals."

On Wednesday, 19 November, the Stress Analysis Group will hold a meeting with the Graduate Section, East Midlands Branch of the Institution of Mechanical Engineers, in the Gas Showrooms Lecture Theatre, Lower Parliament Street, Nottingham, at 7.15 p.m. Mr. H. Fessler will speak on "The fundamentals of photoelasticity."

Manchester Branch Conference

Members outside the Manchester and District Branch may like to have fuller details than were given in the list of meetings of the one-day conference which is being held on October 29th. Its subject is "Optical and Electron Microscopical Properties of Textile Fibres."

At the afternoon session Dr. F. C. Toy, F.Inst.P., will open the Conference and the following four papers will be read.

Review Paper by Professor W. T. Astbury, F.Inst.P.

"Electron Microscopical Studies of Keratinous Objects" by Professor Nils Gralen.

"Electron Microscopical Studies of Fibres and Cell Walls" by Dr. Muhlethaler.

"Sectioning Techniques for the Electron Microscope and Application to Protein Fibres" by Mr. J. Ames.

At the evening session the four papers are:

Review Paper by Mr. J. M. Preston.

"Infra-red Dichroism of Polypeptides" by Dr. A. Elliott.

"Measurement of Orientation in Cotton by Optical Methods" by Mr. R. Meredith, F.Inst.P.

"An Interferometric Method of Studying Radial Variations in Refractive Indices" by Dr. R. Faust, A.Inst.P.

Those wishing to attend should write as soon as possible to the Honorary Conference Secretary, Mr. A. G. Thompson, A.Inst.P., Research Department, Tootal Broadhurst Lee Co. Ltd., 56 Oxford Street, Manchester.

Seventh International Congress of Radiology

In order to become a member of the Seventh International Congress of Radiology which is to be held in Copenhagen

in July 1953, it is necessary to be either a member of a National Radiological body, or sponsored by such a body.

The British Institute of Radiology is willing to act as sponsor for any members of The Institute of Physics who wish to attend. Members who are interested should notify the Secretary of The Institute of Physics.

Cancelled Meeting

The London and Home Counties Branch meeting on November 4th has been cancelled because of Professor Blackett's unexpected absence abroad.

Metallurgical Equilibrium Diagrams

A notice announcing this new volume by W. Hume-Rothery, J. W. Christian and W. B. Pearson, in the Institute's "Physics in Industry Series" appeared in the last issue of the *Bulletin* and a number of members have received copies at the specially reduced rate for their personal use. They are asked to note that owing to an unfortunate printing error which occurred at the press in the last stages, Figure 155 on page 230 has been printed upside down. The electrical conductivity is a minimum at the intermediate composition, as stated at the foot of page 229.

Advanced Course in Mathematics

A course of advanced lectures on differential equations and boundary value problems will be given at West Ham College of Technology on Wednesday evenings from 6.30-9.00 p.m. starting on 15 October, 1952, and continuing throughout the session for about thirty meetings. The fee is £3 3s. Further details may be obtained from the Principal of the College, Romford Road, Stratford, London, E.15.

Nuclear Reactors

A course of thirty lectures on Nuclear Reactors will be given in the City and Guilds College of Imperial College on Friday afternoons at 4.30 p.m., during the 1952-53 session commencing October 10th. The lecturers concerned will be members of the staff of the Atomic Energy Research Establishment, Harwell. It is hoped to conclude the course with a visit to Harwell. Interested persons should communicate with Professor Willis Jackson at Imperial College of Science and Technology, Exhibition Road, South Kensington, London, S.W.7.

Ash and Clinker in Industry

The Institute of Fuel has arranged a special study of ash and clinker in industry, the opening conference of which will be held on the 28 and 29 October, 1952, at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1. The study will take place during the 1952-1953 session with a view to encouraging more economical use of the national fuel resources.

Further details may be obtained from the Institute of Fuel, 18 Devonshire Street, Portland Place, London, W.1.

"There is one worse thing than not practising what one professes, and that is to water down one's professions to match one's practice."

G. A. SUTHERLAND.

THIRD INTERNATIONAL SPECTROSCOPY COLLOQUIUM

The Industrial Spectroscopy Group of the Institute was responsible for the organization of the Third International Spectroscopy Colloquium which was held at High Leigh, Hoddesdon, Hertfordshire, on 1-4 September last. Mr. E. van Someren was the Honorary Colloquium Secretary; 165 people attended, 95 from abroad, and 15 countries

were represented. The demand for places was very heavy and a number of applications had to be refused. The proceedings of the Colloquium are expected to be published elsewhere.

The photograph reproduced below shows most of those who attended.



NEW BOOKS

Opticks. By SIR ISAAC NEWTON. (New York: Dover Publications Inc.) Pp. cxv + 406. Price \$1.90. (Paper-cover edition: cloth edition \$3.95.)

Newton's book in English on the "Reflexions, Refractions, Inflexions and Colours of Light" had a great influence in the years immediately following its publication, and was the centre of a considerable controversy. No one reading it to-day, and knowing the state of the study before Newton's work, can fail to be impressed by the immensity of the contribution he made. The advance is perhaps comparable to the change in our knowledge of semi-conductors between the ignorance of thirty years ago and the completely orderly comprehension we shall have in thirty years' time—but that is the work of many men, and is an advance over a narrower front.

The publishers therefore do us a service by issuing this reprint (collated from various editions, and containing all the Queries) with which is bound up a valuable preface by I. Bernard Cohen, a two-page foreword by Einstein, and an Introduction by Sir Edmund Whittaker. It is so good that one really resents the small pages and thick volume, in the paper binding; they contribute to a book which will not lie open on the table, and which makes the muscles of the wrist ache in holding it open when held up to read. A most uncomfortable format for a most interesting text.

J. H. AWBERY

Plane Trigonometry. By J. TOPPING, M.Sc., Ph.D., D.I.C. (London: Longmans, Green & Co. Ltd.) Pp. 310. Price 10s. 0d.

This is a most useful book for the sixth-former in a Grammar School or the student following an Intermediate course in a Technical College or University.

Normally the physicist uses a text-book to help furnish the basic mathematical knowledge necessary for his physics. Here is something providing much more than this. In particular two chapters make this different from the ordinary text-book. One of them, on vectors, is worth reading for itself alone. Dr. Topping does not confine himself solely to their use in trigonometry but also generalizes a little and proves several of the well-known theorems of elementary geometry. His application of vectors to the sum of two cosines and of two sines formulae provides a much neater proof applicable to the general case than is found in the older text-books and a useful illustration of the technique. The second chapter is on iterative methods of approximating to the roots of an equation. The technique is easy to learn and provides a powerful weapon. The earlier a student of physics or mathematics learns of its advantages the better. Too often it is left too late in a course and in a book of this kind is rarely discussed.

If the art of text-book writings is not to inform but to show the paths to be followed and the techniques required to acquire knowledge then Dr. Topping is a master of the art. His book is a welcome addition to modern mathematical textbooks.

A. K. SMETHAM

CORRESPONDENCE

The Scientific Adventure

Mr. N. Clarke's otherwise very generous review of my book, *The Scientific Adventure*, in the Institute of Physics Bulletin for June, so completely misrepresents my attitude on the ethical problem that I must beg permission to try to remove the misunderstanding. Mr. Clarke states that my treatment of the subject is "capricious." It is true that the word "caprice" occurs once in the chapter in question, but in a context which gives what I am saying a very different significance from that implied by Mr. Clarke's words. Mr. Clarke asks "whether Professor Dingle . . . personally accepts any foundation of ethical behaviour and, if so, what particular 'caprice' determined his choice." My answer is that whatever foundation I personally accept is of importance only to me; the question I was discussing was, what foundation *other than personal choice* can one find—a foundation of such a character that when, as in fact happens, people hold opposite views, they can reduce the problem to it and see which is right. In a "world that includes napalm bombs, refugee children and concentration camps," to quote Mr. Clarke's description, our young men have now to decide whether they will be trained to operate, and perhaps ultimately use, modern weapons, or whether they will refuse and bear the consequences. They are offered, by men who must be presumed equally intelligent and equally sincere, directly conflicting advice. Each adviser, when pressed to justify his conclusions, comes down ultimately to a personal conviction, a dogma; and the dogmas differ. It follows that in fact, whether we like it or not, there is no discoverable general basis for ethical judgments. If Mr. Clarke can find a fallacy in this reasoning (as set out more fully in the book) no one will be better pleased than I. If not, would it not accord better with the high seriousness of the problem to accept the conclusion and face its implications squarely, instead of merely dismissing it as "negative"?

HERBERT DINGLE

UNIVERSITY COLLEGE,
LONDON, W.C.1.

Professor Dingle's reasoning, in which he invites me to find a fallacy, may be logically impeccable, but I do not accept its relevance to the issues which I raised in my review. I did not accuse him of any lack of logic in what he had written; my opinion, which is unchanged, was that what he wrote was valueless as a guide to the problems of the modern world. That is why I questioned whether the conclusion reached by Professor Dingle had even the elementary merit of fitting the facts of his own experience and serving as the basis of his personal behaviour.

Professor Dingle's purpose in writing his essay was,

apparently, to demonstrate that "dogmas" derive from personal conviction and that they differ; one does not need a professorial discourse on such an evident truth—a glance around the world is more compelling than anything Professor Dingle can write. Most of us recognize some difference between the "dogmas" of, say, Albert Schweitzer and Julius Streicher, but how "positive" is a writer on ethics who merely arrives at such a fact? Is there any more pressing method of facing the implications squarely (as Professor Dingle urges) than demanding from those who choose publicly to discuss the problem some indication of their own method of making the choice of "dogma" which is inevitably thrust upon them and us? Professor Dingle asserts that his foundation of behaviour (that is, let us be clear, of his actions towards his fellow men) is of importance only to himself. As a social doctrine I should repudiate such a claim and I also reject it in the context of his essay. Is not the method by which Professor Dingle has arrived at a choice of "dogma" a possible process which may have validity for others? I do not understand how anyone who has made a choice can have so little faith in his own basis of choice as to write, "As to how it" (the ethical problem) "can be solved, I have no suggestions to offer." "Negative" seems to me to be a mild description of such an attitude.

My reference to caprice (which is defined by the Concise Oxford Dictionary as "unaccountable change of mind or conduct") has stung Professor Dingle. He claims, correctly, that he used the word but once—yet he should know that a single word can have a finality to which repetition can add nothing. Significance is not a question of arithmetic. The relevant passage in his essay is as follows:

"The fact that morality cannot be based on experience or on reason leaves open the question what its basis may be. We are still faced with the problem 'How shall I choose?' and I have no solution to offer. We do not without reluctance accept a conclusion that leaves the most fundamentally important thing in our lives a matter of caprice, and I do not offer it as a gospel but simply as an inescapable fact."

In my review I wrote, quite fairly, surely, "He accepts as 'an inescapable fact' that the basis of morality is 'a matter of caprice'." The quoted passage occurs in the penultimate paragraph of the essay and follows ten pages of argument; it is not unreasonable to take it as Professor Dingle's considered conclusion. I am reminded of Edgington's words—"If I may say it with reverence, the soul and God laugh together over so odd a conclusion."

NORMAN CLARKE

THE INSTITUTE OF PHYSICS,
LONDON, S.W.1.

NEWS OF MEMBERS

The following appointments have been notified:

Fellows

- J. A. V. Fairbrother—Professor of Physics, University of Natal, South Africa.
W. R. Lane—Senior Principal Scientific Officer, Chemical Defence Experimental Establishment, Ministry of Supply.
C. J. Milner—Professor of Applied Physics, New South Wales University of Technology, Sydney, Australia.

Associates

- J. S. Preston—Senior Principal Scientific Officer, National Physical Laboratory, Teddington, Middlesex.
H. Anderson—Head Master, Carlton Grammar School, Bradford.
H. L. Carson—Research Physicist, The British Welding Research Association, Abington Hall, Abington, Cambridgeshire.
J. F. Dillon—Technical Staff, Bell Telephone Laboratories, Murray Hill Laboratory, New Jersey, U.S.A.

The Institute of Physics

E. D. Hart—Head of Technical Department, Equipment Division, Mullard Limited.

S. B. Jackson—Deputy Head of Research Department, The Irving Aircraft Co. of Great Britain, Letchworth, Hertfordshire.

E. R. Johnson—Senior Scientific Officer in Charge, Instrumentation Section, High Speed Aerodynamics Laboratory, Salisbury, South Australia.

R. Parker—Department of Physics, University College, Bangor, North Wales

E. Stanley—Postdoctorate Fellowship, University of Southern California, Los Angeles, U.S.A.

M. C. K. Tweedie—Associate Professor of Statistics, Department of Statistics, Virginia Polytechnic Institute, Blacksburg, Virginia, U.S.A.

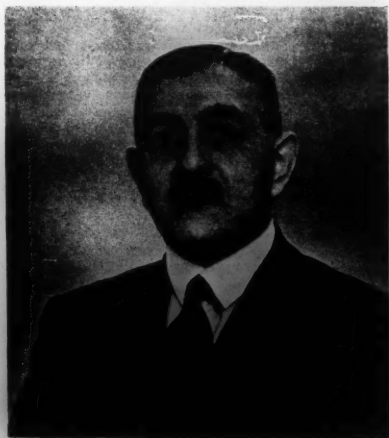
MEMBERS OF NOTE

Stephen Harvey Piper, D.S.O., D.Sc. Professor Piper was born in 1887 and educated in Darlington and London, graduating in 1910 from King's College, London, with first class honours in physics. The following year he became a research student at University College, Nottingham, and shortly afterwards a Lecturer there. He had a distinguished record in the First World War, serving with the Sherwood Foresters. He saw action in Gallipoli and France, was wounded at Suvla Bay, mentioned three times in despatches and awarded the D.S.O. During the Second World War Professor Piper was with an Operational Research Group and also served as Second-in-Command of the Bristol Sector of the Home Guard.

For the last thirty years Professor Piper has been associated with the University of Bristol, being appointed a Lecturer in Physics in 1921. He was promoted to be Reader in 1933 and Assistant Director of the H. H. Wills Physical Laboratory in 1948. A Chair was specially created for him in 1951.

Professor Piper's own research has been mainly concerned with the study, by X-ray methods, of the structure of aliphatic compounds. Working with Professor A. C. Chipnall, he developed the use of the long spacings of aliphatic compounds combined with data on transition temperatures of crystalline forms to give a quantitative analysis of mixtures of long-chain homologues. From this a scheme covering the metabolism of plant and insect waxes was developed. He was awarded the D.Sc. degree in 1931.

A Fellow of The Institute of Physics since its foundation in 1920, Professor Piper was elected a member of the Board in 1950.



George Robert Noakes, M.A. Mr. Noakes is the first schoolmaster to have been elected to the Board of the Institute, a fact which is a measure of the regard in which he and his writings are held. Now 46 years of age, he was educated at King's School, Peterborough (a Cathedral chorister and King's Scholar) and Hertford College, Oxford, graduating in physics in 1928. His teaching career has included five years at Manchester Grammar School and eleven years at Giggleswick School, where he was in charge of the Science Department. Since 1948 he has been at Uppingham School, his chief teaching work being sixth-form physics.

It is perhaps by his four text-books that Mr. Noakes is best known. They have been widely acclaimed for their originality of outlook and more than 120,000 copies have been sold.

Elected to Associateship of the Institute in 1933 and to Fellowship in 1942, Mr. Noakes became a member of the Board in 1950; his special knowledge of the problems of the schools has been particularly valuable to the Education Committee. He serves as Vice-Chairman of the Institute's Education Group and for the past three years has been the Assessor in pure physics for the examinations for National Certificates in Applied Physics.

NATIONAL CERTIFICATES IN APPLIED PHYSICS

National Certificate examinations were held this year at fourteen colleges. Thirty-three candidates entered for the Higher National Certificate and 137 for the Ordinary Certificate. For examinations in England and Wales the Institute's Assessors were again the following three Fellows: Mr. G. R. Noakes (Physics), Dr. J. Topping (Mathematics) and G. W. Warren (Applied Physics). For the Scottish examinations Dr. G. Morris (Fellow) was the Assessor in all three subjects. The names of the successful candidates are given below. In addition the names are given of a number of candidates who passed the final examination but have not fully complied with all the requirements for the award of certificates. In most cases these candidates have completed only a one-year course; they will all be eligible to enter the first year of the course for the Higher National Certificate.

ENGLAND AND WALES

*Higher National Certificates in Applied Physics**Acton Technical College*

R. J. Heskins.

G. C. Lloyd.

Liverpool College of Technology

A. H. Andres.

F. Baynes (*Distinction in Mathematics*).

D. A. Rowell.

E. J. Smith (*Distinction in Mathematics*).

R. Watkins.

*Northampton Polytechnic*P. Baggs (*Distinction in Mathematics*).

J. C. Bland.

F. C. Cheetham.

V. E. Dyke.

R. E. Hines.

B. Jones (*Distinction in Mathematics*).

J. Smalley.

J. Watts.

Rotherham Technical College

A. B. Collier.

J. D. Lavender.

J. France.

*Royal Technical College, Salford*N. MacFarlane (*Distinction in Mathematics*).*South-East London Technical College*

J. S. C. Large.

Endorsement. D. W. Berry (*Distinction in Industrial Physics—Optics*).*Ordinary National Certificates in Applied Physics**Acton Technical College*

R. E. Fraser.

L. E. Hogbin.

M. A. Rose.

D. F. Wood.

*College of Technology, Birmingham*R. C. Benson (*subject to subsequent compliance with a minor course requirement*).

E. J. Cutler.

G. A. Goode.

M. D. Griffin.

Liverpool College of Technology

T. M. Donnan.

N. Gardiner.

J. Hamlin.

C. M. Jones.

W. E. Lacey.

S. J. Lowe.

D. A. Simmonds.

N. Stokes.

J. Taylor.

F. R. Tipping.

Northampton Polytechnic

G. H. Barlow.

W. G. Collis.

J. C. G. Eustace.

A. R. Joy.

D. W. Lewin.

B. J. Loomes.

E. J. Rice.

S. E. Simmonds.

D. W. Turner.

K. W. Twinn.

Schools of Technology, Art and Commerce, Oxford

M. L. Awcock.

D. Jowitt.

T. V. Parsons.

A. J. J. Perks.

Harris Institute, Preston

W. J. Thompson.

Reading Technical College

I. W. Collip.

D. C. M. Matthews.

J. H. Nevitt.

M. S. Stagg.

R. J. Tilden.

J. F. Watts.

Rotherham Technical College

A. V. Sanderson.

P. Turton.

H. Warwick.

Royal Technical College, Salford

D. Brooks.

K. P. McDonagh.

I. R. Reynolds.

R. Turnbull.

M. E. Turner.

South-East London Technical College

I. R. Ashcroft.

J. Balderston.

N. L. Holden.

S. E. Jeffs.

D. T. Jenkins.

P. C. H. Parsons.

R. R. Smith.

A. F. D. Verrall.

R. J. Wales.

P. J. Westoby.

Chance Technical College, Smethwick

J. K. Gillespie.

D. J. J. Holland.

J. L. Norris.

Sunderland Technical College

F. R. Bown.

E. Brewer.

W. Burnham.

R. Colling.

The following candidates have passed the examination after a one-year course:—

Acton Technical College

L. A. Lloyd.

College of Technology, Birmingham

E. Hobbs.

Liverpool College of Technology

R. F. Ferris.

Royal Technical College, Salford

J. O. Winterburn.

South-East London Technical College

P. J. Willmoth.

Sunderland Technical College

N. Robson.

M. N. Stebbings.

SCOTLAND

*Higher National Certificate in Applied Physics**Royal Technical College, Glasgow*

J. M. Milne.

*Ordinary National Certificates in Applied Physics**Paisley Technical College*

J. M. Johnston.

A. P. Lyon.

A. H. McNeil.

J. S. McQuistan.

APPOINTMENTS VACANT

The inclusion of particulars of a vacancy must not be taken to imply that the Institute necessarily approves of the terms offered or that might be offered. Candidates should satisfy themselves that these are satisfactory, and they may always refer to the Institute for advice.

A Physicist or Engineer (B.Sc. Honours or Higher National Certificate) is required for development work in methods of non-destructive testing and for the design, construction and maintenance of instruments for use in research. Preference will be given to candidates with good experience in electronics aged below 30 years. The post carries superannuation. Application should be made to the Director of Research, **Aluminium Laboratories Limited**, Banbury, Oxon.

Chemists, Engineers and Physicists required for production, development and maintenance in Atomic Energy factories at Sellafield, Cumberland; Salwick, Preston; and Capenhurst, Chester. Qualifications: Honours Degree or Membership of Professional Institution. Candidates with Sections A and B (or equivalent) considered. Starting salary within range £363-£833 according to age and experience. Good prospects. Applications to **Ministry of Supply**, Division of Atomic Energy (Production), Risley, Nr. Warrington, quoting reference 374.

Physicist required for experimental work in Leeds upon development and test of gamma radiation detectors. Preferably a young graduate with some research experience, not necessarily in this field. Manipulative skill essential and experience of electronic equipment very desirable. Salary in range £400-£600 according to qualifications. Apply Box No. A.V.27, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

Graduate with degree in physics, chemistry or engineering, required for Laboratory in Technical Department engaged on the development of Laboratory equipment, including design, testing, standardization and handling technical inquiries. Applicants, age 25-35 years, should be primarily interested in apparatus and instruments, keen, enterprising and capable of ultimately taking charge of the Laboratory. Salary according to age and qualifications. Pension scheme. Write, Technical Adviser, **A. Gallenkamp and Co. Ltd.**, 17-29 Sun Street, London, E.C.2.

Research Physicist required for work in the field of solid state physics. Applicants must possess at least a second-class honours degree in physics. Some experience after graduation is desirable but not essential. The person appointed may be allowed to apply for registration as a student for a higher degree. Duties to commence as soon as the successful applicant is available. Salary according to experience and qualifications. Applications, including the names of two referees, should be sent to the Professor of Physics, **The University, Reading**.

Canterbury University College, Christchurch, New Zealand. Applications are invited for the following appointments: **Lectureship in Physics**—applicants should have an honours degree and experience in research. Salary—£800×£50-£950 per annum. **Assistant Lectureship in Physics**—applicants should have an honours degree; research experience would be an advantage. Salary—£375×£50-£675 per annum. Duties to commence on February 1, 1953, or as soon as can be conveniently arranged. Further particulars and information as to the method of application should be obtained from the Secretary, Association of Universities of the British Commonwealth, 5 Gordon Square, London, W.C.1. The closing date for the receipt of applications is October 20, 1952.

Physicist required by well known firm of instrument makers in London for laboratory work in connection with the development of scientific instruments and apparatus. Previous experience not necessary but applicants should preferably hold a degree in physics or light electrical engineering. Apply giving full details of training and experience and stating age and salary required to Box No. A.V.28, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

British Nylon Spinners Limited has a vacancy for a **Physical Chemist** in their Research Department which is open to graduates with a good honours degree, aged 21 to 30 years. Candidates must have experience and a keen interest in U.V. and infra-red spectroscopy and some industrial experience would be an advantage. The appointment offers very good opportunities for the right man and will carry a good starting salary plus participation in the Company's pension scheme. Applications should be sent to the Personnel Manager, Pontypool, Monmouthshire.

Imperial Chemical Industries Limited, Nobel Division, has vacancies for **Assistant Technical Officers** for research work on Guided Weapons. Applicants should have a pass degree (or its equivalent) in science with chemistry of physics as the principal subject. For certain of the posts a knowledge of electronics would be an advantage. Application should be made to the Staff Manager, I.C.I. Nobel Division, 25 Bothwell Street, Glasgow, C.2.

Senior Physicists and Chemists and new honours graduates in these subjects required by **Research Association of British Rubber Manufacturers**. Senior graduates are required to supervise the work of a few graduates in addition to carrying out research themselves. The Association's work includes researches on the elastic and viscous properties of rubbers, oxidation of rubber and related olefines, analytical and physicochemical problems. Modern equipment, including an infra-red spectrometer, is available. Interest in the application of research to practical problems is essential, as much of the work will involve applied as well as pure research. Starting salary within the range £500 to £900 depending on qualifications, age and experience; superannuation under Federated Superannuation System for Universities. Appointments initially at Croydon, Surrey, but moving during second half of 1953 to Shawbury, near Shrewsbury, Salop. Assistance may be given to staff in building houses in Salop and a few rented houses will be available for junior graduates. Apply to Secretary, R.A.B.R.M., 105 Lansdowne Road, Croydon.

Ministry of Supply require **Senior Scientific Officer** at R.A.E. outstation, Woodbridge, Suffolk. Duties: To study problems arising out of the marshalling and landing of aircraft; design, conduct and evaluate full-scale experiments to define principles of methods for achieving high rate of safe handling using electronics or other flying aids; prepare functional specifications for components of such systems. Candidates, minimum age 26, must possess 1st or 2nd class honours degree or equivalent in physics or electrical engineering and at least 3 years' post-graduate research experience. Experience in current techniques in aeronautical, electronic, electro-mechanical fields desirable. Salary according to qualifications and experience within inclusive range £781-£980; lower for women. F.S.S.U. unestablished. Application forms from Ministry of Labour and National Service, Technical and Scientific Register (K), Almack House, 26 King Street, London, S.W.1, quoting A226/52A. Return by October 24th.

Nelson Research Laboratories, English Electric Co. Ltd., Stafford, have vacancies for two senior research scientists to study the influence of physical and metallurgical properties on the magnetic characteristics of ferromagnetic materials and the development of improved materials. Applicants must have a good honours degree and several years' post-graduate and industrial experience on the physics and metallurgy of magnetic materials. Previous experience of leading a group is desirable but not essential. Please write giving full details and quoting reference 310C to Central Personnel Services, English Electric Co. Ltd., 24-30 Gillingham Street, London, S.W.1.

Applications are invited from suitably qualified persons for the research staff of the **British Cast Iron Research Association**, for the investigation on the soundness of iron castings. Applicants should possess an honours degree or its equivalent and some previous research and/or industrial experience would be an advantage. The appointments will be in the Scientific Officer (£418-£676 p.a.) or Senior Scientific Officer (£785-£980 p.a.) grades according to age, experience and qualifications.

Applicants should submit full details of qualifications, age and experience to **British Cast Iron Research Association**, Alvechurch, Birmingham.